

PEARSON ISLAND EXPEDITION 1969†—10. OPISTHOBRANCHS

by ROBERT BURN*

Summary

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Three species of opisthobranch molluscs from Pearson I., *Notarchus indicus* (Schweigger), *Aporodoris merria* Burn n.sp. and *Goniodoris meracula* Burn, and one species from nearby Flinders I., *Sagaminopteron ornatum* Tokioka & Baba, are new records for South Australia. Additional distributional data are given for *G. meracula* and *S. ornatum*.

Introduction

The opisthobranch molluscan fauna of South Australia is relatively poorly known, especially with regard to the naked or "nudibranch" species of the western coastline of the State. Thus it is not unexpected that any collection from this area should contain new species and new records.

Three species described in this paper were collected during the 1969 Pearson Island Expedition, organized by the Royal Society of South Australia and the South Australian Department of Fisheries and Fauna Conservation. The Pearson Islands are the small southern part of the Investigator Group at the eastern end of the Great Australian Bight. The largest island, Pearson I., is about 162 hectares in extent, but the others are much smaller; they lie 64 km southwest of Elliston.

The fourth species in this paper was collected during a stop-over by the Expedition at Flinders I., a large island that forms the northern part of the Investigator Group.

The specimens have been deposited in the National Museum of Victoria, Melbourne (NMV).

Order CEPHALASPIDEA
Superfamily PHILINACEA
Family GASTROPTERIDAE

Sagaminopteron ornatum Tokioka & Baba, 1964: 218. Bennett, 1966: pls. 1, 120b. Baba, 1970: 47.

FIGS. 1-2

Material: Flinders I., Jan. 1969; 2 specimens from 10 m on *Cystophora* on vertical rock face in fair surge (NMV, F27399).

The living animals were reported as "bright blue under water, parapodia edged with bright yellow". They are now colourless and 12 and 9 mm long, 6 and 5 mm broad. When alive, the larger animal was almost 25 mm long.

The one major difference between the Japanese type specimens and Australian material (Fig. 1) is the presence of a relatively large strong shell in the mantle cavity beneath the posterior caudal lobe of the body. The shell of the larger Flinders I. specimen (Fig. 2) is 2 mm long by 1.4 mm wide, and is white with a yellowish transparent protoconch, the interior of which is open. The shell of a Lord Howe I. specimen is 2.4 x 1.7 mm, one from Cockburn Sound, Western Australia, is 2.1 x 1.6 mm, and another from Heron I., Queensland, is almost 4 mm long.

It must be assumed that the shells of the Japanese types dissolved during fixation and preservation.

Though hitherto unrecorded, *Sagaminopteron ornatum* is a fairly common species in eastern and southern Australia. Specimens examined by the writer are:

1. Lord Howe I.—Middle Beach, Jan. 1959, R. R. Blackwood, 1 specimen (NMV, F20717).
2. Queensland.—Heron I., Capricorn Group, Aug. 1965, I. Bennett, 1 specimen. Humpty

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† Other accounts of the geomorphology and biology of the Pearson Islands are given in Volume 95, Part 3 (1971) of the Transactions, as well as in the present Part.

1. I. Keppel Group, Sept. 1969, *N. Coleman*, 1 specimen.
3. New South Wales.—Angourie, Aug. 1966, *A. A. Cameron*, 1 specimen. Minnie Waters, Jan. 1963, *G. Biddle*, 1 specimen. Bawley Point, near Ulladulla, Dec. 1963, *I. Bennett*, 3 specimens.
4. Victoria.—Bear Gully, Waratah Bay, April 1970, *I. Marrow*, 6 specimens.
5. South Australia.—Port Noarlunga, Feb. 1966, *R. Balfour*, 1 specimen (SAM, 14888). Anxious Bay, Dec. 1968, *T. Castle*, 1 specimen.
6. Western Australia.—West of Carnac I., Cockburn Sound, Feb. 1971, *B. R. Wilson* & *N. Coleman*, 4 specimens (WAM, 474-71).

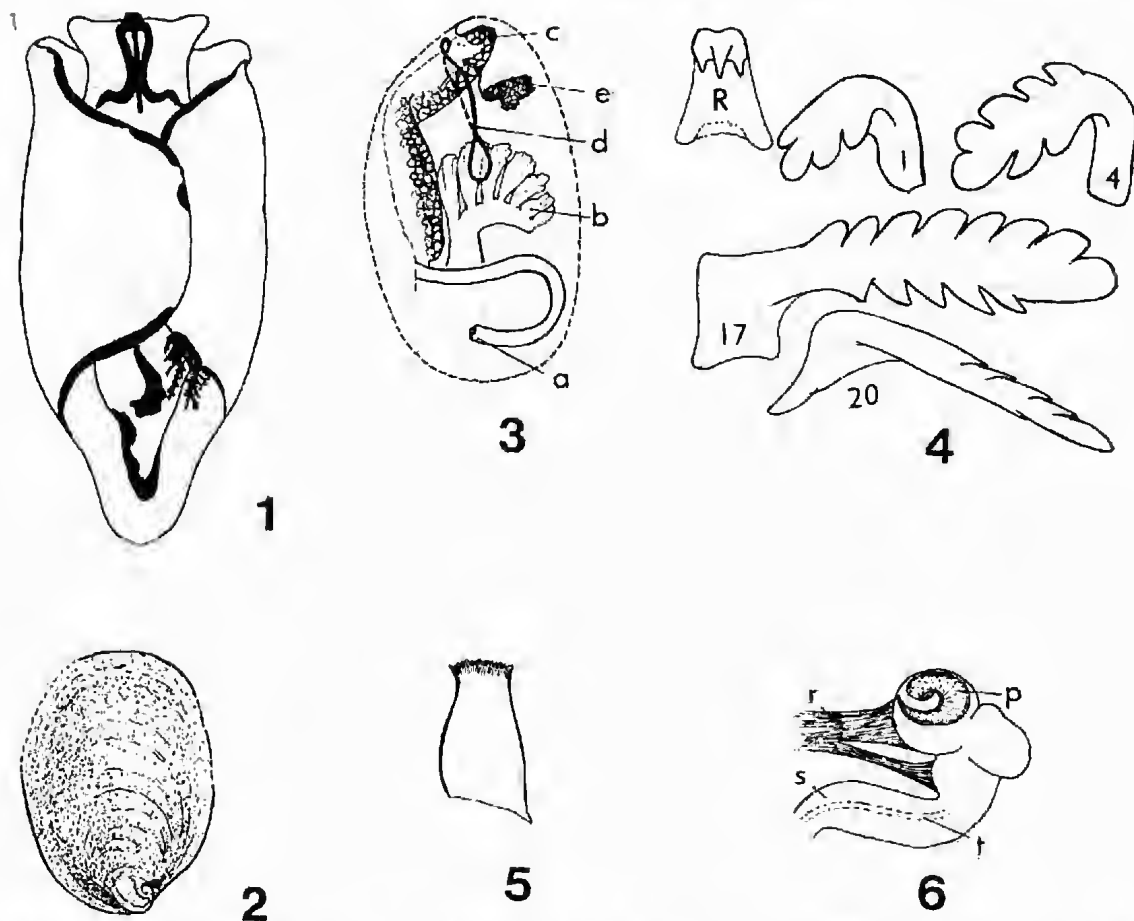
These specimens were collected from between the intertidal zone and 20 m depth, from beneath boulders, from brown algae, or from grey branching sponges. They have often been observed, in rock pools and deeper water, to swim with a rapid synchronous undulation of the parapodia.

Order ANASPIDEA
Family APLYSIIDAE

Notarchus indicus Schweigger, 1820. Bergh, 1902: 349. Engel, 1936: 113. Eales, 1944: 12.

FIGS. 3-6

Material: Pearson I., Jan. 1969, 1 specimen from algae on horizontal faces at 26 m (NMV, P27401).



Figs. 1-2. *Sagaminopteron ornatum*. Fig. 1.—Dorsal view of a 20 mm long specimen from Port Noarlunga, S. Aust., from a sketch by Dr Helene M. Laws, Curator of Marine Invertebrates, South Australian Museum. Fig. 2.—Shell from larger Flinders I. specimen, dimensions 2 x 1.4 mm.

Figs. 3-6. *Notarchus indicus*. Fig. 3.—Diagram of mantle cavity and aperture (a—anus, b—gill, c—pigment gland, d—mantle aperture, e—opaline gland). Fig. 4.—Radular teeth. Fig. 5.—Jaw element. Fig. 6.—Male copulatory organ (p—penis, r—retractor muscles, s—sheath, t—seminal groove).

The colourless preserved specimen is 5 mm long, 3.5 mm wide and 3 mm high. The head and neck are invaginated into the smooth visceral hump. The 1 mm long mantle aperture (Fig. 3d), of the usual external shape, is placed well forward. The large mantle cavity, not yet pervious with the dorsal mantle aperture, contains a small lobulated gill (Fig. 3b), a long loop of the intestine terminating well behind the gill stem at the anus (Fig. 3a), a long curved granular pigment gland (Fig. 3c), and a small white opaline gland (Fig. 3e). No genital groove is apparent. Short stumpy rhinophores with deep lateral grooves project from the head, and a small rounded knob-like oral tentacle occurs either side of the mouth.

The jaw elements (Fig. 5) are narrowest just below the serrulate distal end. The hyaline radula (Fig. 4) is almost 2 mm long with 21 rows of 20.1.20 teeth. The rhachidian tooth is slender with sharply pointed cusp and a short denticle each side. The lobulate first lateral tooth has one inner and two outer denticles, and the next six teeth have up to two inner and four outer denticles. The succeeding teeth have longer cusps with up to five inner and nine outer denticles at the third or fourth tooth from the margin. The marginal tooth has one inner denticle well back from the tip and about four incipient outer denticles.

The minute male copulatory organ (Fig. 6) agrees exactly with the figure for Mauritius specimens given by Engel (1936, p. 116, fig. 4) with the exception that the grooved smooth penis has not as many spiral turns.

Discussion: The descriptions by Bergh (1902) and Engel (1936) of specimens from Mauritius, plus that of a specimen from Zanzibar (Eales 1944), satisfactorily diagnose *Notarachus indicus*. The spiral unarmed penis justifies the identification of this very small Pearson I. specimen. The small number of lateral teeth (20), the marginals of which are not slender and smooth, does not agree with the above three descriptions where the lateral teeth number 43-45, 33 and 32 respectively and the marginals are long, slender and smooth. However, the Pearson I. specimen is probably a juvenile in which the radula has not attained the full complement of teeth nor the penis the full number of turns.

Notarachus indicus has a wide Indo-west Pacific tropical and subtropical distribution, and has been recorded from Sydney Harbour, New South Wales (Engel 1936, p. 119). It is a new record for South Australia.

Order DORIDACEA
Tribe CRYPTOBRANCHIA
Family DORIDIDAE

Aporodoris merria n.sp.

FIGS. 7-11

Material: Pearson I., Jan. 1969, 1 specimen (holotype) from red algae at 52 m (NMV, F27402).

The alcohol preserved specimen (Fig. 7) is dull orange-fawn in colour. It measures 8 mm long, 5 mm broad and 3.5 mm high. The notum is covered with various sized tubercles (Fig. 8b), the largest of which are somewhat flatly clavate and up to 0.6 mm in diam. All tubercles have projecting angles both laterally and dorsally. Bundles of spicules strengthen each angle. The rhinophoral cavities are protected by four tubercles; a large one at each side, a small one in front and a small one behind each cavity (Fig. 8a). The branchial cavity has nine or ten lappet-like tubercles of various sizes along the margin (Fig. 8c); these tubercles are up to 1 mm long and 0.8 mm wide and have small projecting angles or points on the outer or dorsal face only.

The thick fleshy hyponotum is narrower than the foot (Fig. 9), from which it is separated laterally by little more than the foot margin. The genital aperture opens in the middle width of the hyponotum. The lamellate rhinophores are completely withdrawn. There are five multipinnate gills. The head (Fig. 10) lies within a deep concavity of the anterior hyponotum, with a grooved ridge-like oral tentacle at each side of the mouth. The broad foot is anteriorly truncate with the upper lamina leading into the head cavity where it is notched. The tail is thin and broadly rounded.

The thick labial cuticle is smooth. The radula is 1.7 mm long and 1.4 mm wide. It has 40 rows of 61 teeth per half row. All teeth are hook-shaped and bear a single outer denticle beside the cusp, except for the two marginals which have 10 or more comb-like denticles (Fig. 11).

The brittle genital organs could not be examined satisfactorily. The whitish ampulla is long and winding. The yellow vas deferens is short and twisting, and terminates in an unarmed penial sheath without penial papilla.

Discussion: The angular, flattened, clavate tubercles of the notum and the single prominent outer denticle of the lateral radular teeth separate *A. merria* from other species of *Aporodoris* Ihering, 1886. The unarmed penis of the new species is similar to that of *Thor-*

disa Bergh, 1877, but in that genus the lateral teeth are smooth. The radula is also similar to that of *Taringa* Marcus, 1955, but the unarmed penis of *A. merria* contrasts with the cuticularized penial papilla and spines of the former genus.

The concavity of the head and the large lappet-like tubercles of the branchial margin are further distinguishing characters. The relatively flat underside of the specimen, with the head parts recessed, suggests that *A. merria* has unusual feeding preferences.

The specific name is derived from "merri", an Australian Aboriginal word meaning stones, in allusion to the notal tubercles.

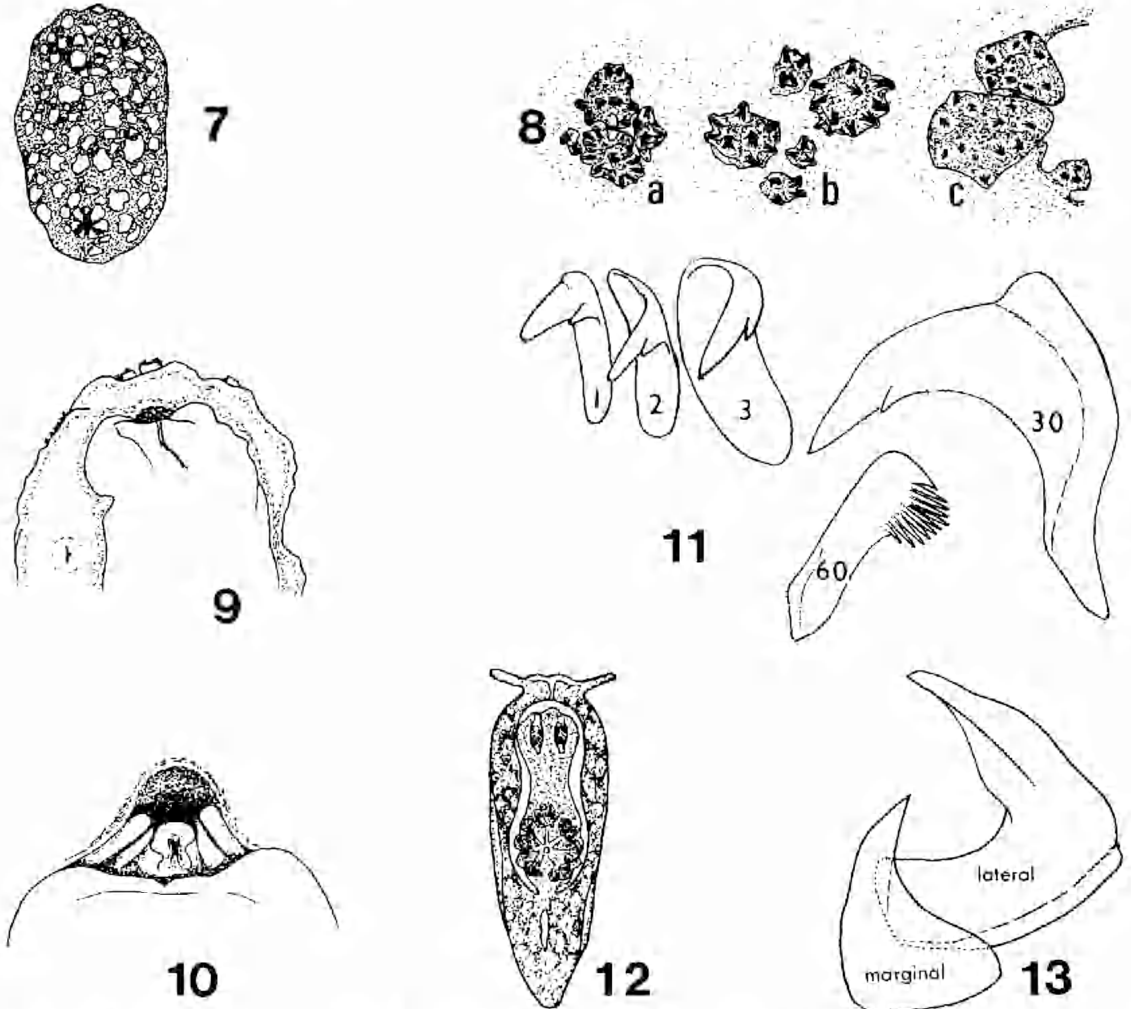
Tribe PHANEROBRANCHIA
Superfamily SUCTORIA
Family GONIODORIDIDAE

Goniodoris meracula Burn, 1958: 27; 1966: 227.

FIGS. 12-13

Material: Off Dorothee, Jan. 1969, 1 specimen from algae at 65 m (NMV, F27400).

The colourless preserved specimen measures 7.5 mm long and 3.5 mm broad. Living specimens (Fig. 12) are usually yellowish with darker brown mottling. Important characters for the identification of this species are the smooth body, the high notal flange open be-



Figs. 7-11. *Aporodoris merria*. Fig. 7.—Dorsal view of preserved holotype. Fig. 8.—Notal tubercles from rhinophoral cavity (a), middle of the notum (b), and branchial margin (c). Fig. 9.—Anterior hyponotum. Fig. 10.—Detail of head with anterior foot folded down. Fig. 11.—Radular teeth.

Figs. 12-13. *Goniodoris meracula*. Fig. 12.—Dorsal view of an 8 mm long specimen from Point Danger, Torquay, Vic. Fig. 13.—Half row of radular teeth from Sydney Harbour specimen.

hind the gills, the short caudal crest, and the seven gills.

The species has been very rarely collected. The holotype was found eating into a yellowish compound ascidian beneath a stone at Point Danger, Torquay, Victoria (Burn 1958), and a second specimen was recorded from Portsea Pier, Port Phillip Bay (Burn 1966). A third specimen was taken by the writer at Point Danger, Torquay, Dec. 1963, where it was crawling on brown algae.

Three specimens (Australian Museum, C312), dredged in Sydney Harbour, New South Wales, on 11 June 1892, are a new record for that State and the only other specimens known to date. Each measures 10.5 mm

long by 5.5 mm wide. The radula (Fig. 13) of one specimen has the formula $26 \times 1,1,0,1,1$; the lateral tooth is strongly hooked with smooth cusp, while the marginal tooth has much the same shape and is about half the size of the lateral tooth.

Goniodoris meracula is a new record for South Australia.

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